

S11MS3/ S21MS3/S21MS4

High Density Surface Mount Type Mini-flat Package Phototriac Coupler

■ Features

1. Ultra-compact, mini-flat package type
(3.6 x 4.4 x 2.0mm)
2. Built-in zero-cross circuit
(S21MS4)
3. High isolation voltage between input and output ($V_{iso} : 3\,750V_{rms}$)
4. Recognized by UL, file No.E64380

■ Model Line-ups

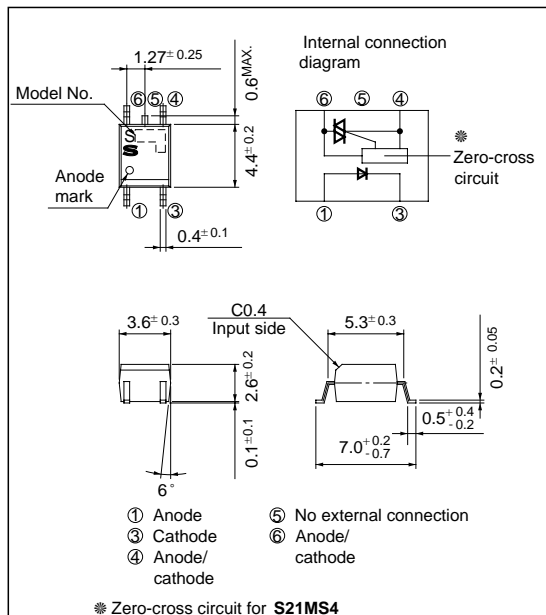
	For 100V lines	For 200V lines
No built-in zero-cross circuit	S11MS3	S21MS3
Built-in zero-cross circuit	-	S21MS4

■ Applications

1. For triggering of medium/high power triacs

■ Outline Dimensions

(Unit : mm)



■ Absolute Maximum Ratings

(Ta = 25°C)

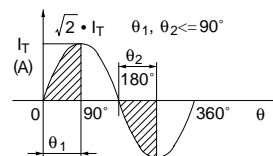
Parameter	Symbol	Rating		Unit
		S11MS3	S21MS3/S21MS4	
Input				
Forward current	I_F	50		mA
Reverse voltage	V_R	6		V
Output				
*1 RMS ON-state current	I_T	0.05		A_{rms}
*2 Peak one cycle surge current	I_{surge}	0.6		A
Repetitive peak OFF-state voltage	V_{DRM}	400	600	V
*3 Isolation voltage	V_{iso}	3 750		V_{rms}
Operating temperature	T_{opr}	- 30 to +100		°C
Storage temperature	T_{stg}	- 40 to +125		°C
*4 Soldering temperature	T_{sol}	260		°C

*1 The definition of conduction angle θ of effective ON current I_T should be as shown in the right drawing.

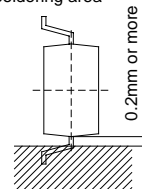
*2 50Hz sine wave

*3 40 to 60% RH, AC for 1 minute

*4 For 10 seconds,



Soldering area



■ Electro-optical Characteristics

($T_a = 25^\circ\text{C}$)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage	V_F	$I_F = 20\text{mA}$	-	1.2	1.4	V
	Reverse current	I_R	$V_R = 3\text{V}$	-	-	10	μA
Output	Repetitive peak OFF-state current	I_{DRM}	$V_{\text{DRM}} = \text{Rated}$	-	-	1	μA
	ON-state voltage	V_T	$I_T = 0.05\text{A}$	-	-	2.5	V
	Holding current	I_H	$V_D = 6\text{V}$	0.1	-	3.5	mA
	Critical rate of rise of OFF-state voltage	dV/dt	$V_{\text{DRM}} = 1/\sqrt{2} \cdot \text{Rated}$	100	1 000	-	$\text{V}/\mu\text{s}$
	Zero-cross voltage	S21MS4 V_{OX}	$I_F = 15\text{mA}$, Resistance load	-	-	35	V
Transfer characteristics	Minimum trigger current	I_{FT}	$V_D = 6\text{V}$, $R_L = 100\Omega$	-	-	10	mA
	Isolation resistance	R_{ISO}	DC500V, 40 to 60% RH	5×10^{10}	10^{11}	-	Ω
	Turn-on time	S11MS3/S21MS3 S21MS4	t_{on} $V_D = 6\text{V}$, $R_L = 100\Omega$, $I_F = 20\text{mA}$	-	-	100	μs
				-	-	50	

Fig. 1 RMS ON-state Current vs. Ambient Temperature

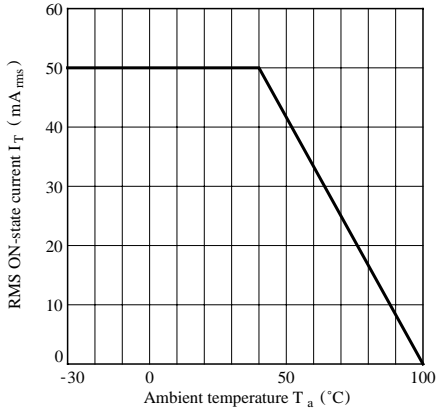


Fig. 2 Forward Current vs. Ambient Temperature

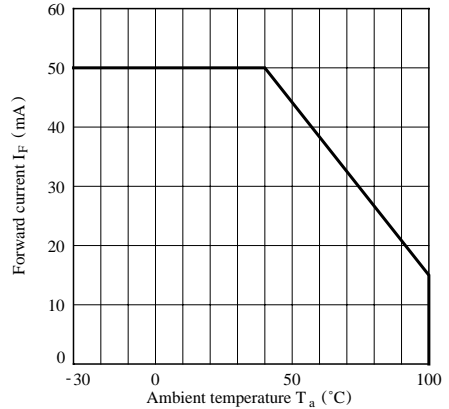


Fig. 3 Forward Current vs. Forward Voltage

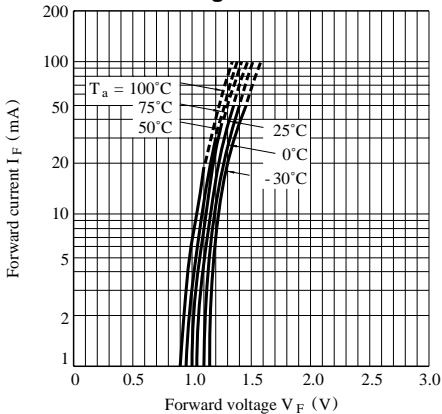


Fig. 4-a Minimum Trigger Current vs. Ambient Temperature (S11MS3/S21MS3)

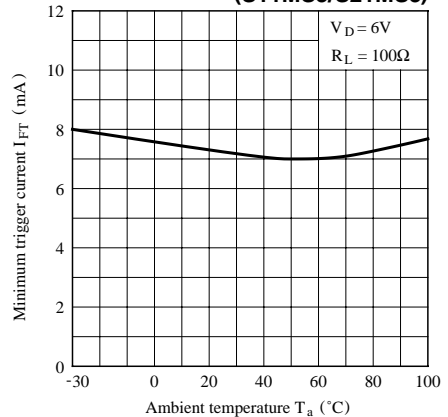


Fig. 4-b Minimum Trigger Current vs. Ambient Temperature

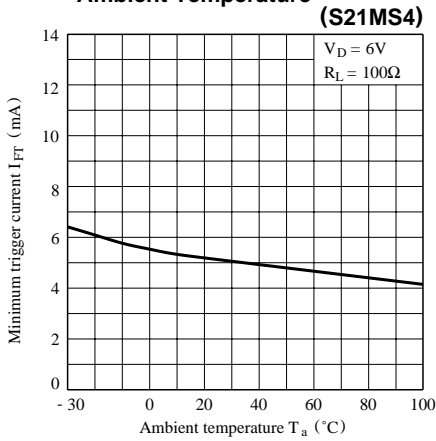


Fig. 5-a Relative Repetitive Peak OFF-state Voltage vs. Ambient Temperature (S11MS3/S21MS3)

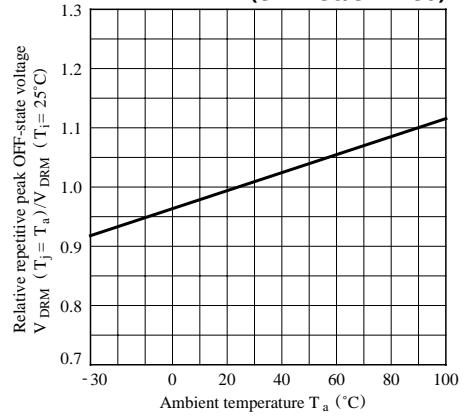


Fig. 5-b Relative Repetitive Peak OFF-state Voltage vs. Ambient Temperature (S21MS4)

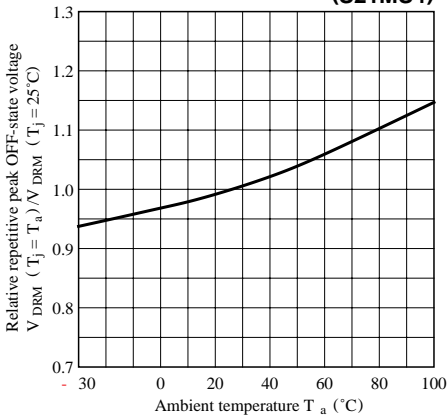


Fig. 6 ON-state Voltage vs. Ambient Temperature

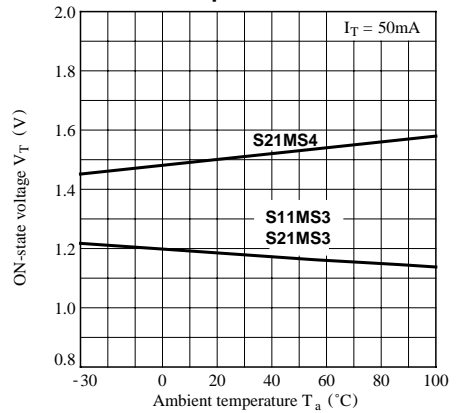


Fig. 7-a Holding Current vs. Ambient Temperature (S11MS3/S21MS3)

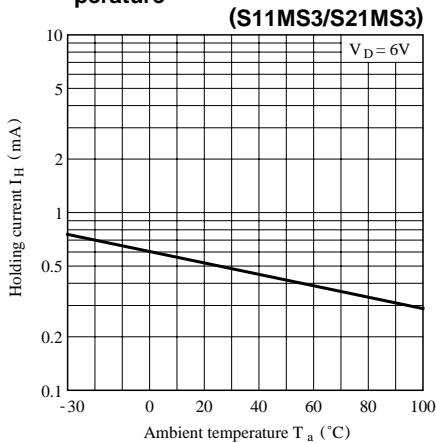


Fig. 7-b Holding Current vs. Ambient Temperature (S21MS4)

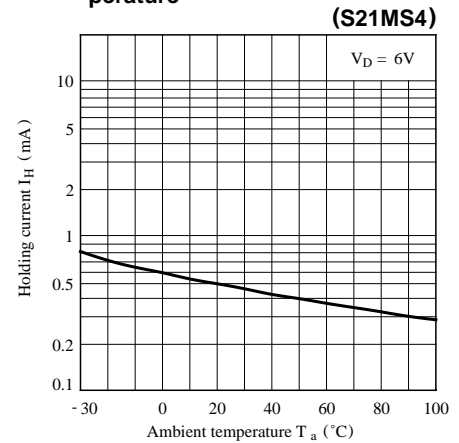


Fig. 8-a Repetitive Peak OFF-state Current vs. OFF-state Voltage (S11MS3)

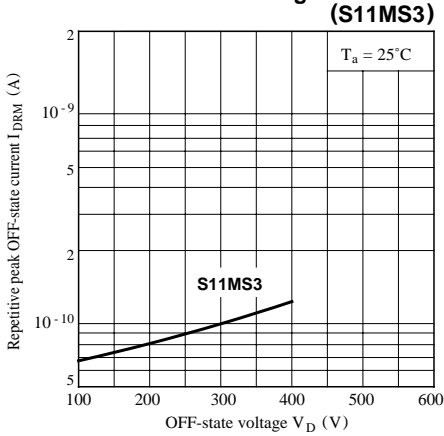


Fig. 8-b Repetitive Peak OFF-state Current vs. OFF-state Voltage (S21MS3/S21MS4)

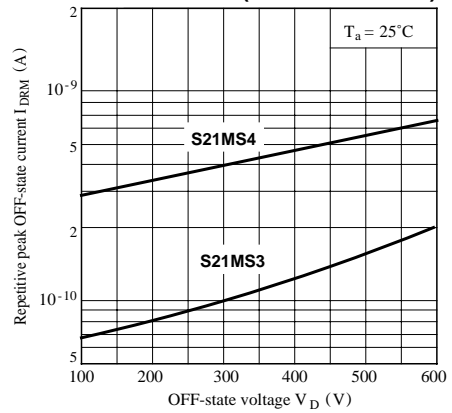


Fig. 9 Relative Repetitive Peak OFF-state Current vs. Ambient Temperature

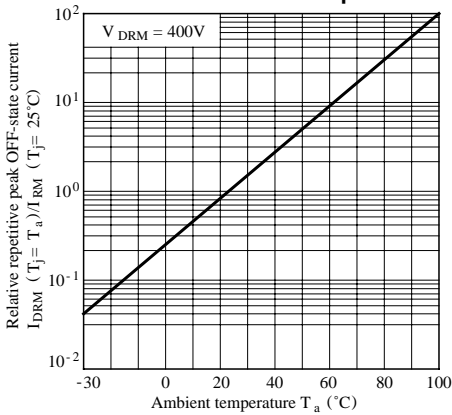


Fig.10 Zero-cross Voltage vs. Ambient Temperature (S21MS4)

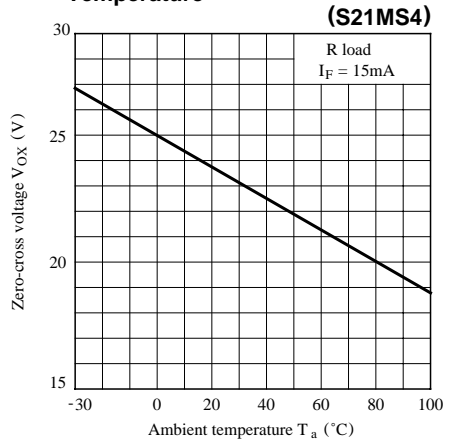
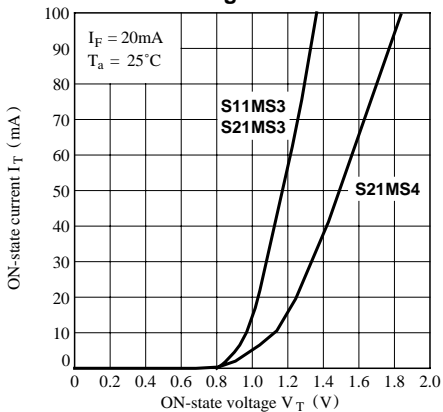
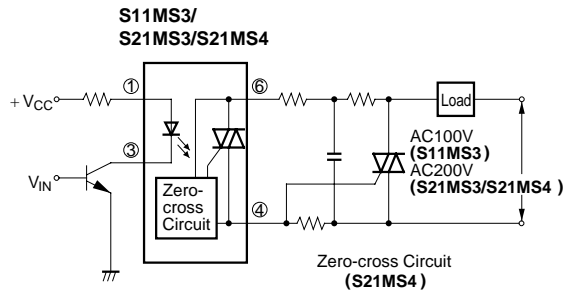


Fig.11 ON-state Current vs. ON-state Voltage



Basic Operation Circuit



• Please refer to the chapter "Precautions for Use." (Page 78 to 93).